

Smoke Control Listed Terminal Box Controller - Electronic Output

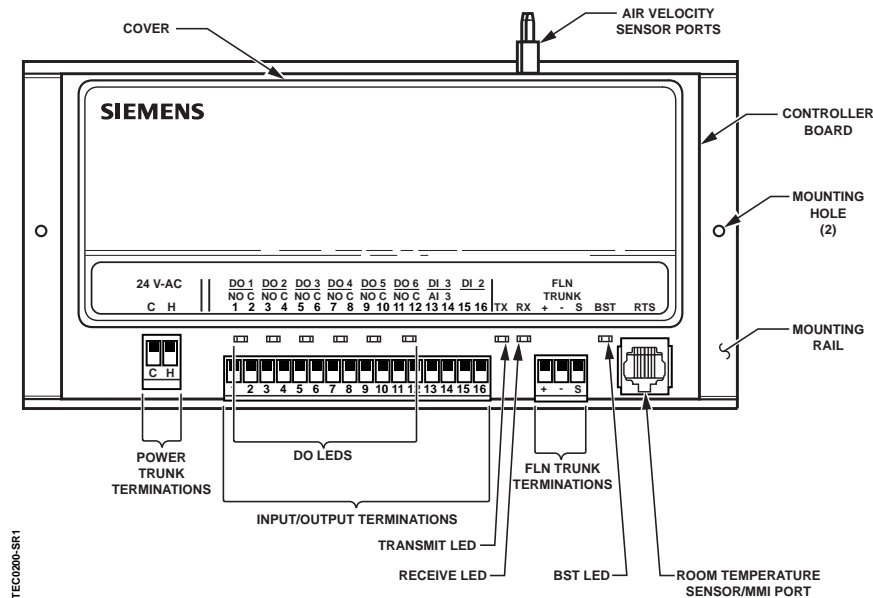


Figure 1. Smoke Control Listed Terminal Box Controller - Electronic Output.

Control Applications

2020 through 2027

2120 through 2127 (Secure Mode Applications)

Shipping carton includes a controller assembly (controller board and cover), a mounting rail, Autozero Module with bracket (optional), and two self-tapping screws.

Product Description

The Terminal Equipment Controller (TEC) provides high performance DDC of pressure-independent, variable-air-volume zone-level routines. The TEC can operate stand-alone or can be networked to perform complex HVAC control functions.

The TEC can also be used as part of a Siemens engineered smoke control system. The TEC are used to initiate the operations of dampers and fans but the smoke control strategy will be initiated from any of the APOGEE field panels and not by the TEC.

These instructions explain how to field install or replace a Terminal Box Controller — Electronic Output with or without an Autozero Module or Secure Mode (540–X00C only).

Product Numbers

540-100K	Smoke Control Listed Smoke Control Listed Terminal Box Controller - Electronic Output
540-100CK	Smoke Control Listed Smoke Control Listed Terminal Box Controller - Electronic Output with Secure Mode
540-200K	Smoke Control Listed Smoke Control Listed Terminal Box Controller - Electronic Output with Autozero module
540-200CK	Smoke Control Listed Smoke Control Listed Terminal Box Controller - Electronic Output with Autozero module and Secure Mode



CAUTION:

Keep the unit in its static-proof bag until installation.

Accessories

540-658P25	Low cost temporary temperature sensor that enables space control if the permanent room or duct sensor is not installed.
------------	---

Parts for Smoke Control Compliance

540-155K	Smoke Control Listed Small Equipment Controller Enclosure
550-002K	Smoke Control Listed Large Equipment Controller Enclosure
ZBX-XXXX ^a	Smoke Control Listed Large Equipment Controller Enclosure
5041MWCB	UL Listed Class 2 transformer with 120/240/277/480 Vac 50/60 HZ 0.4A primary w/ hub and 24Vac 50VA secondary w/ hub and circuit breaker
10041MWCB	UL Listed Class 2 transformer with 120/240/277/480 Vac 50/60 HZ 0.5A primary w/ hub and 24Vac 96VA secondary w/ hub and circuit breaker
KELE AM-2483-OA	UL Listed Class 2 Transformer with primary 120V 60 HZ 0.2A secondary 24 Vac 30 VA
529-804	Receptacle assembly consisting of a UL Listed 2x4 junction box and UL Listed receptacle

a. Enclosure part number ZB-X-XXXX, where the first X can be 9 or any letter from A to N represents the type of TEC module installed/to be installed in the enclosure, and XXXX can be any 4 alphanumeric characters represent the TEC HVAC application.



For smoke control application, primary rating is only 120V/ 60 Hz.

Parts for CE Compliance:

550-705	Clamp-on ferrite filter (10 pack)
588-100 series	Approved 2-RJ11 RTS cable in 25', 50', or 100' (7.6-m, 15.2-m, 30.48-m).

Warning/Caution Notations



WARNING:

Personal injury/loss of life may occur if you do not follow the procedures as specified.



CAUTION:

Equipment damage or loss of data may occur if you do not follow the procedures as specified.

Expected Installation Times

10 minutes.

Required Tools and Materials

- Electro-Static Discharge (ESD) wrist strap
- Flat-blade screwdriver (1/8-inch blade width).
- Small flat-blade screwdriver
- Cordless drill/driver set
- 1/4-inch (6.35 mm) hex nut bit

Prerequisites

- Terminal Box installed
- 24 Vac Class 2 power source
- Supply power to the unit is OFF
- If required, controller enclosure installed
- Room temperature sensor installed (optional). (If desired, a low-cost temporary temperature sensor is available that plugs into the RTS port of the TEC (P/N 540-658P25), providing temperature input and actual space control until the permanent room or duct sensor is installed.)



If the controller is being installed on a box with 1 or more stages of electric heat, the 550-809 MOV with pre-terminated spade connectors must be installed across the manufacturer-supplied airflow switch. MOV's can be installed at the time the controller is factory mounted; coordinate with the box manufacturer prior to order placement. For field installation, reference document 540-986.

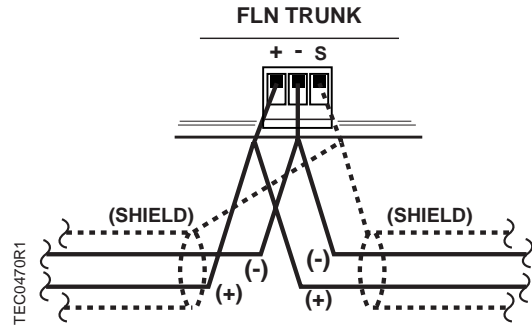


Figure 2. FLN Wiring.

Instructions



All wiring must conform to NEC and local codes and regulations.

Transformer Installation for Smoke Control Applications

P/N 5041MWCB and 10041MWCB

1. Mount the transformer to a facility installed UL Listed junction box (2x4 or 4x4).
 Mount the integral conduit nipple through the knock-out on the junction box.
2. Connect the secondary wires to the TEC using UL Listed CL2 or equivalent cables.

P/N KELE AM-2483-OA

1. Use Siemens receptacle box assembly (P/N 529-804), installed only inside the enclosure (P/N: 550-002K).
2. Plug the transformer (P/N KELE AM-2483-OA) in to the receptacle.
3. Connect the secondary wires to the TEC using UL Listed CL2 or equivalent cables.

Controller Installation

1. Secure the mounting rail (Figure 1) in the controller's desired location.
2. Place the ESD wrist strap on your wrist and attach it to a good earth ground.
3. Remove the controller from the static proof bag and snap it into place on the mounting rail.
4. Connect the FLN (Figure 2).



CAUTION:

Do not ground the shield.

5. Connect the point wiring (see Wiring Diagrams).
6. **540-200 and 540-200C:** Install the Autozero Module and connect the wires to DO6 (Figure 5). See installation instructions 540-199.
7. Plug the room temperature sensor cable into the RTS port (Figure 1).
8. Connect the power trunk (Figure 3). **DO NOT** apply power to the controller.

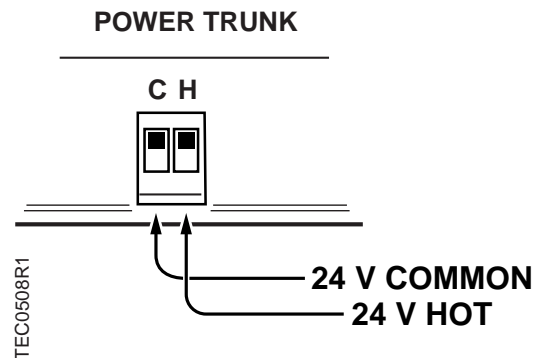


Figure 3. Power Trunk Wiring.

9. Connect the tubing from the air velocity sensor pickups to the ports on the controller or Autozero Module (Figure 5). Connect HI to HI and LO to LO.

The installation is complete.

Smoke Control Compliance

The following instruction and information apply if used for smoke control sequence.

1. If used for Smoke Control, install Smoke Control Listed product, enclosure and transformer (see *Product Numbers* and *Accessories* sections).

2. Input Rating:

- 24V 60 HZ 42 VA

Digital Output (DO) Electrical Ratings:

- Transformer P/N 5041BCWB: maximum 6VA per DO/ maximum 30 VA total.
- Transformer P/N 10041BCWB: maximum 6VA per DO/ maximum 36 VA total.
- Transformer P/N AM-2483-OA: maximum 6VA per DO/ maximum 16 VA total.

3. The room temperature sensor (RTS) is installed in the same room as the TEC.

4. Connection from the TEC to the APOGEE field panel is maximum 4000 feet, 24 AWG minimum.

5. Wiring Range:

- Transformer: primary 14 AWG
- 24 Vac Input Power: 14 to 18 AWG
- DO: AI: 18 to 20 AWG
- DI: 18 AWG
- LAN: 20 to 24 AWG
- RST: 24 AWG

6. Refer to the following documents when used configuring for smoke control application:

- 125-1806: Smoke Control Systems Application and Engineering Manual
- 125-1816: Smoke Control System Application Guide
- 125-1817: NFPA and UL Standards Relevant to Smoke Control System Application Guide

CE Compliance

If CE compliance is required, a ferrite filter must be placed approximately 1–2 cm from the end of the cable being shielded (RTS cable and the point wiring for AI3) (Figure 4).

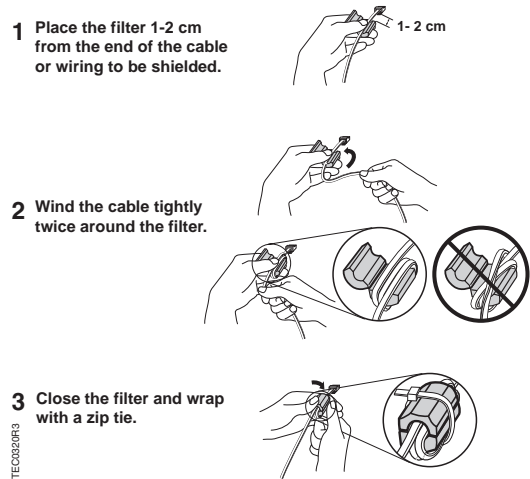
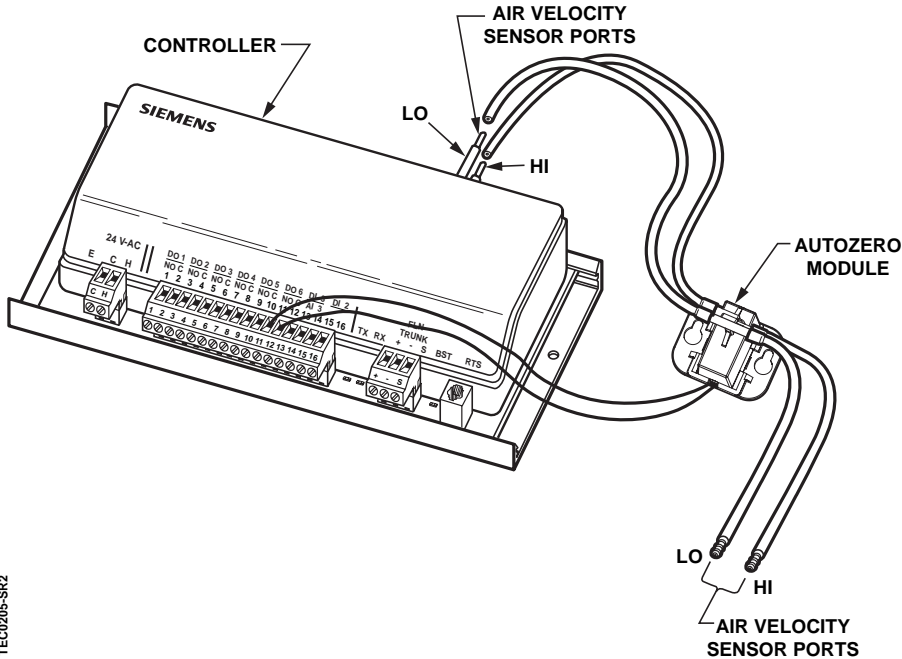


Figure 4. Ferrite filter(s) for CE Compliance.



TEC0205-SR2

Figure 5. Smoke Control Listed Terminal Box Controller - Electronic Output with Autozero Module.

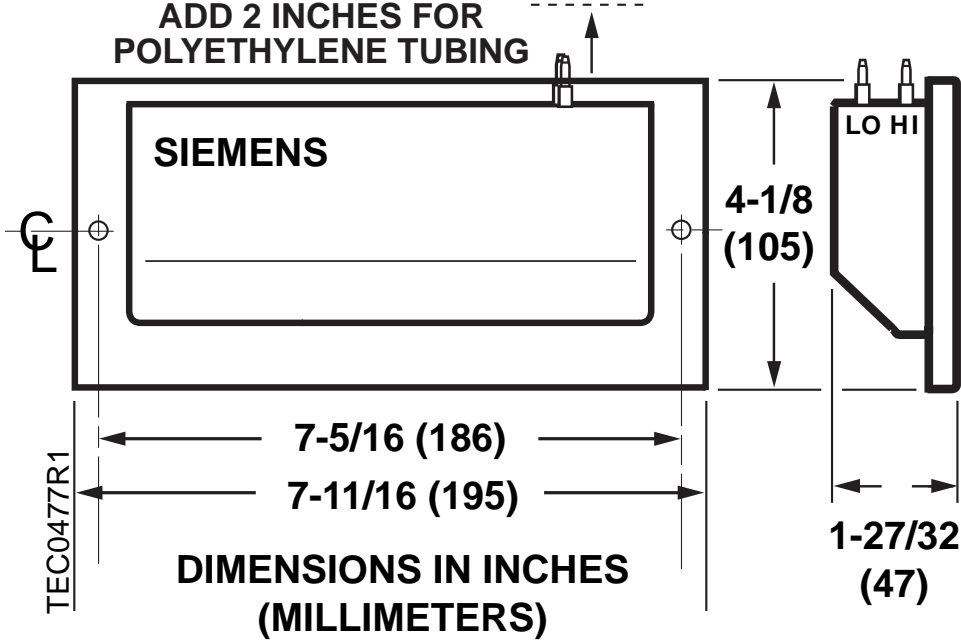


Figure 6. Dimensions.

Wiring Diagrams



CAUTION:

The controller's DOs control 24 Vac loads only. The maximum rating is 6 VA for each DO. Use an interposing 24 Vac relay module (such as P/N 550-054) for any of the following:

- VA requirements higher than maximum
- Separate transformers to power the load
- Power limited Direct Current (DC) power requirements



The 24 Vac relay module is not applicable for smoke control application.

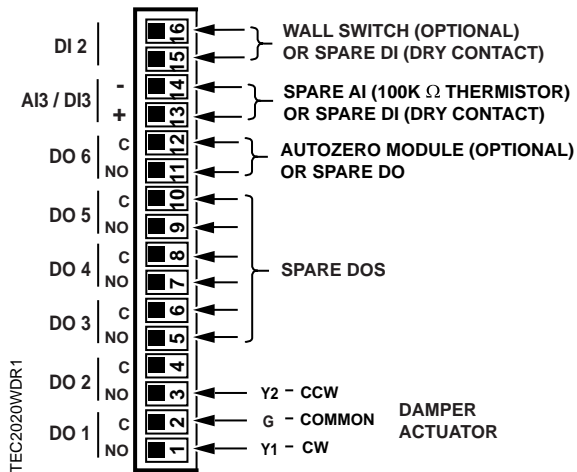


Figure 7. Application 2020 and 2120 Wiring Diagram (Cooling Only).

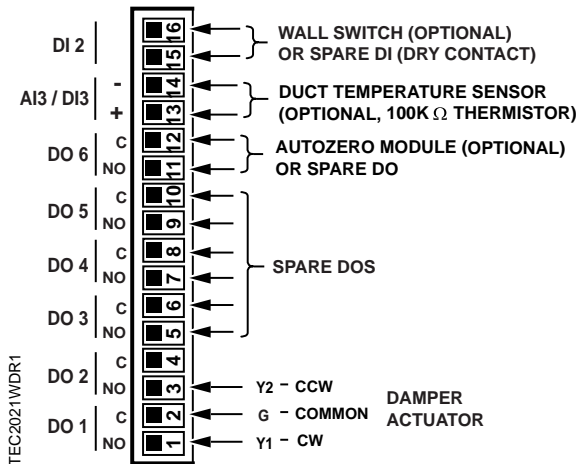


Figure 8. Application 2021 and 2121 Wiring Diagram (Heating or Cooling).

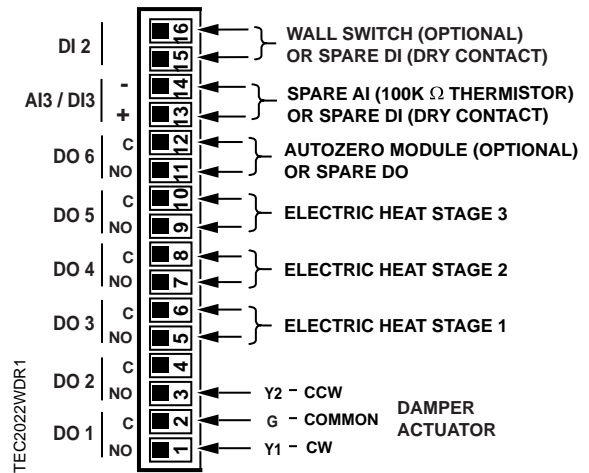


Figure 9. Application 2022 and 2122 Wiring Diagram (Electric Heat).

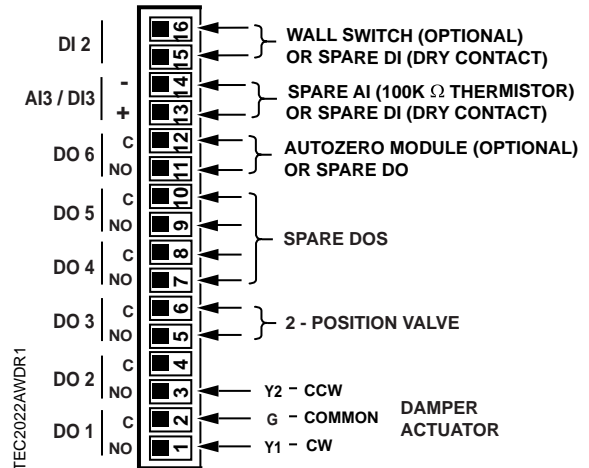


Figure 10. Application 2022 and 2122 Wiring Diagram (Baseboard Radiation).

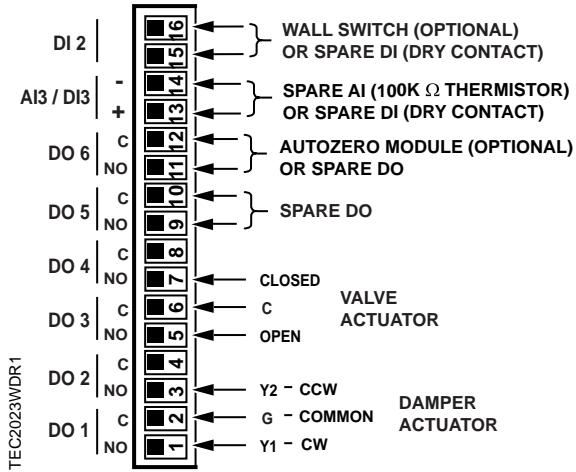


Figure 11. Application 2023 and 2123 Wiring Diagram (Hot Water Heat).

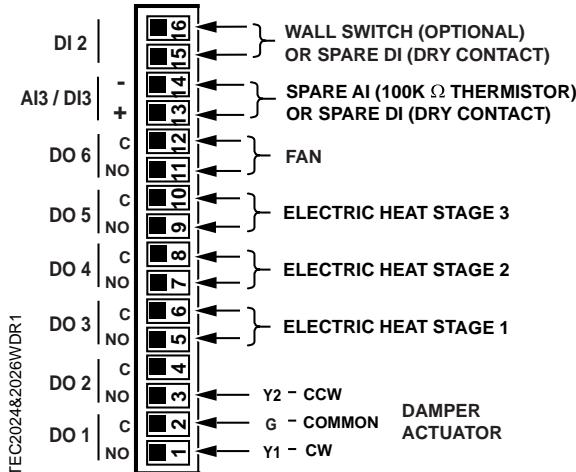


Figure 13. Applications 2024/2026 and 2124/2126 Wiring Diagram (Series Fan and Parallel Fan with Electric Heat).

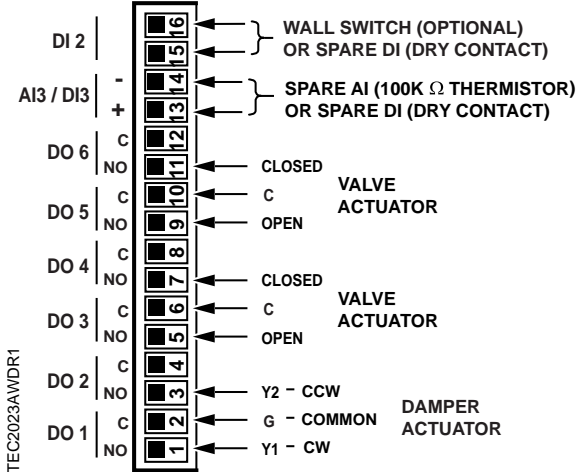


Figure 12. Application 2023 and 2123 Wiring Diagram (Hot Water Heat with 3 motors).

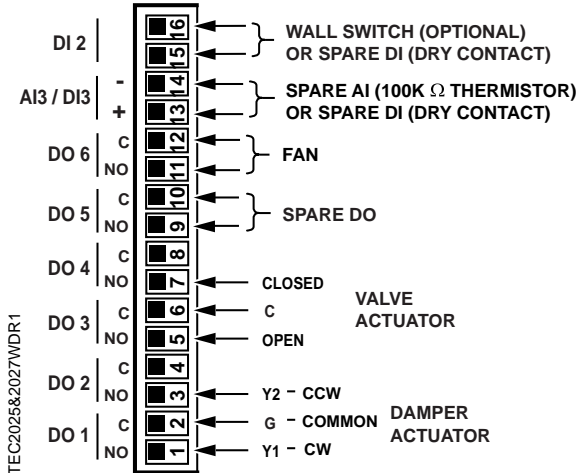


Figure 14. Application 2025/2027 and 2125/2127 Wiring Diagram (Series Fan and Parallel Fan with Hot Water Heat).

Information in this document is based on specifications believed correct at the time of publication. The right is reserved to make changes as design improvements are introduced. Product or company names mentioned herein may be the trademarks of their respective owners.
© 2009 Siemens Building Technologies, Inc.